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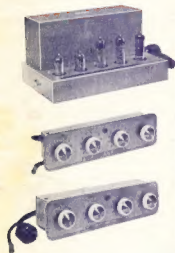
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**EDITORIAL****1960 . . . AND FORWARD!**

By the time this issue of "Amateur Radio" reaches Australian Amateurs 1960 will have dawned. What this year—and the years ahead—hold for us is something for speculation indeed. At the time of going to press the outcome of the International Telecommunications Conference held in Geneva from August until December last year is not finally settled. John Moyle, VK2JU, our accredited representative with the official Australian delegation, completed his mission for the Wireless Institute of Australia and returned to his home immediately to undergo a most serious operation. One of our first New Year wishes will be for his rapid and complete recovery—a wish which we know every Amateur in Australia will join with us in conveying to John and his family.

The task which John undertook on behalf of us all was gigantic; what he achieved for us in the way of a vast and comprehensive report on the entire conference and its effect on our hobby was a superhuman effort. For this our thanks will be eternally his, and his report to the Federal Council of this Institute will be gratefully received although it will be somewhat delayed due to his unfortunate illness. We cherish a sincere hope that by the time you read this issue of the magazine he will have passed a dangerous milestone in his life and be well on the way to recovery.

Despite the most prolific and dangerous opposition to the frequencies formerly allocated to the Amateur

Service, we have emerged from the conflict with less damage than anticipated at one stage in the proceedings of the Conference. The pressure for frequency space was far beyond anything we imagined, and if it had not been for the firm stand taken by many countries who rate the Amateur service as something worthwhile in the world of communications, we would have fared far worse than what the final result of the Conference is anticipated to be.

It is probable that we shall lose the 100 kc. off the top end of the 80 metre band, but in return we shall have an exclusive assignment whereas previously the band was shared with fixed and mobile services.

In Region III. it is likely that we shall lose 50 kc. off the top end of the 40 metre band; this agreement for Region III. is a disastrous one for the Amateurs in this Region and is tied up with politics over which we have so little control that the possibility of a change of attitude faded as the Conference progressed. There is some hope that the Conference will agree to the removal of short-wave broadcasting from the 7.0 to 7.1 Mc. exclusively assigned portion of the band, but this will not finally be known for some time.

There is every reason to believe that the 20, 15, 11 and 10 metre bands will remain as they are at present with the exception of a possible very small reduction in the 15 metre band to make way for space frequencies. This too is indefinite.

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work to give audio a.v.c., but in the receiver here this was not done by the manufacturer, although the components were included. Possibly there was a wiring omission in the factory, or some models were altered for a definite requirement. This is mentioned because the instruction book does not show this variation.

In using the product detector it will be found that a.m. stations can be read without the b.f.o. being switched on, if a high signal level is fed into the detection system. This is mainly due to the fact that the diode is also operating and is coupled into the 6G8G cathode. By turning back the r.f. gain control this leakage disappears and a.m. stations then require use of the b.f.o. to obtain detection.

There is a slight tendency for the set to motorboat when using the product detector, when the audio volume control is turned up very high, but this is of no consequence here as the speaker output as this point is too high anyway and would only worry the neighbours. So much for the product detector.

## FREQUENCY STABILITY

Whilst the stability of the AR7 is of a high order, it can be improved still further and is a must for s.s.b. Two things were done here, the first being to fit a 5 pF. negative temperature condenser from the stator of the h.f. oscillator to the frame of the condenser. This was fitted at the top of the condenser when looking down into the set and has helped quite a lot. All coils then want re-aligning slightly to bring them back to calibration.

The second approach to the stability problem was to use voltage regulation on both oscillators. A voltage regulator valve, VR150, was mounted horizontally in the set in the space between the waver switch for the product detector and the shield of the crystal, keeping it as far away as possible from the latter. A small octal socket was mounted on the end wall of the chassis, using short sections of  $\frac{1}{4}$  inch copper tube as spacers. The cathode of this valve is taken to the common earth system under the chassis, whilst the anode is connected to one end of the 7,500 ohm 20 watt resistor mentioned before. The h.t. connections to the h.f. and b.f.o. oscillators were traced and were connected at the resistor where it goes to the anode of the regulator valve. The b.f.o. dropping resistor was short circuited. The dropping resistors to the h.f. oscillator were not removed, but a 6J8G valve was substituted for the original 6X8G.

These simple modifications have made a big difference to the frequency stability and it is now felt that most of the drift which occurs when tuned to VVWV is due to the b.f.o. The drift is far less than that observed on many Amateurs, including the s.s.b. stations.

## TUNING RATE

S.a.b. demands that the receiver have a very slow tuning rate as it is necessary to tune the receiver and set the b.f.o. within a few cycles of the original carrier. As mentioned before, the AR7 can do this but it's a rather tedious affair and if several stations are in an s.s.b. network and are not exactly netted, then matters become very complex

for the listener. The first thing to be done is to improve the ability to set the b.f.o. and this is done by substituting a large diameter knob for the small one. A bakelite knob of the same diameter as that on the main dial will just fit, without fouling the b.f.o. switch. A similar knob should be placed on the crystal filter phasing control, not only to balance the looks of the set, but to give an added vernier effect when tuning the crystal filter. The next thing to be done is to bandspread the coil boxes. Data for bandspreparing for the 14, 21 and 28 Mc. bands has been given in the excellent series of articles mentioned before.

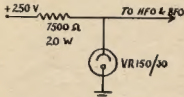


Fig. 2—AR7 Voltage Regulator.  
The jumper in the VR150 is not used.

However the amount of bandspread on the 7 Mc. band leaves a lot to be desired. Therefore a coil box was modified and bandspread is now such that the box covers only 7.0 to 7.19 Mc. Whilst this amount of bandspread makes the AR7 appear to have the selectivity of a crystal set, it does make the tuning in of s.s.b. stations a very simple matter.

Details of the modifications are as follows:

**1st r.f. coil.**—14 turns of 18 gauge enamelled wire wound on a  $\frac{3}{8}$ " slug-tuned former. Length of winding, 1". Primary, 3 turns of 30 en. wire interwound with bottom three turns of the secondary.

**2nd r.f. coil.**—As above, but primary has six turns.

**Mixer coil.**—As above, but primary has nine turns.

**Oscillator coil.**—9 turns of 18 gauge en. wire wound on a 1" diameter former, slug-tuned. Length of winding,  $\frac{3}{8}$ ". The plate winding is four turns of 30 en. wire interwound with bottom turns of grid winding.

Across the small trimmer condenser in the coil box are mounted two silver mica condensers, one of 100 pF. and the other of 25 pF. (If a band C box is used it will have two trimmers. Connect these in parallel and delete the 25 pF. condenser). On each coil assembly locate the short lead that connects the grid end of the winding to the stator of the gang condenser. Replace this lead with a silver mica condenser of 20 pF.

The boxes are re-aligned by using the slug to set the box to 7.0 Mc. with the dial at 500, and the trimmer is used to set the box to approx. 7.2 Mc. with the dial at 0.

As in use here, 7.15 Mc. occurs at 130 on the dial when 7.0 Mc. is found at 500. There is a certain amount of interaction between the trimmer and the slug in each box when aligning the coils. The method used here was to connect a signal generator to the grid

of the mixer valve, through a small condenser with a half meg. resistor as grid leak to earth.

With the gang condenser at minimum capacity the oscillator trimmer was adjusted to get a signal on the high side. The generator was then moved lower in frequency and the slug adjusted. Several repetitions were required to get the tracking correct. When this was done, the signal generator was moved to the grid of the 2nd r.f. stage and the mixer grid coil was adjusted. The same procedure was carried out with the other coils.

If it is thought that this is too much bandspread, then it is possible to remove the 25 pF. condenser from the coil assembly and increase the value of the series condenser from 20 pF. to 47 or 50 pF. This will then place 0 on the dial at about 7.450 Mc. when 7.0 Mc. falls at 500 on the dial.

This method of bandspreparing could be used with the existing coils in an existing D box, but a spare one was not available here, so a spare C box was used.

## -tone control

The tone control as fitted to the AR7 is the type used in most b.c. sets and simply cuts off the higher audio frequencies. The tone control shown in the circuit was installed.<sup>3</sup> When the arm of the pot. is at the earthed end, there is a certain amount of treble cut, but this is not carried to extremes. With the arm of the pot. at the other end, there is treble accentuation and an amount of bass cut. If a linear pot. is used, the system will give a flat output with the arm in the centre position.

This type of tone control assists greatly when listening to stations which are "boomy" due to distance or other causes. It also helps the intelligibility under bad conditions and has been found a worthwhile feature.

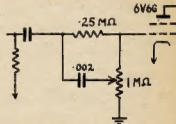


Fig. 3.—Tone Control for AR7.

Components whose values are not shown are normal receiver components. This tone control gives treble cut, through a flat response to bass cut with slight treble increase.

## TUNING S.S.B.

The method of tuning s.s.b. is to tune the receiver with the r.f. gain control at maximum, for greatest output from the receiver, for any given audio volume control setting. This peaks the sideband in the bandpass of the receiver's i.f. system. The r.f. gain is then turned down, the b.f.o. switched on, and adjusted until the speech becomes natural. If necessary, the r.f. gain is adjusted as well as the b.f.o., but this is not as important with the product detector as it is with the diode detector. Audio volume is controlled

(Continued on Page 9)

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# WHAT VALUE COMPONENT?

## KNOWING HOW TO SUBSTITUTE CAN SAVE YOU MONEY

LEWIS G. McCOY, W1ICP

NO doubt you have wondered at times how the designer of a piece of radio gear arrives at the values of the different components used in it. Also, you've probably been mystified by the fact that different component values have been used for what seem to be identical purposes in similar pieces of equipment. And—probably more important to you as a prospective builder—you've debated what values can be substituted while still having the unit work as the designer intended.

Actually, there are very few critical values in a piece of radio gear. For example, it is relatively simple to design two transmitters having the same output power and covering the same frequency ranges but with quite different component values in each one. In this article the functions of some of the more commonly used components will be discussed, and the question of what values can be substituted will be considered.

### CAPACITORS

Let's take capacitors first and see what they are used for and what values will be suitable in each application. One of the things a capacitor will do is pass r.f. and audio currents but stop d.c. In radio circuitry it is sometimes necessary to shunt such currents across certain parts of the circuit, and a "bypass" capacitor is used for this purpose. For example, a bypass is usually connected across points in the circuit where the power supply voltages are introduced. The bypass capacitor prevents r.f. from flowing back into the supply. Another case is where a resistor used for d.c. voltage dropping may offer an undesirably high impedance path to r.f. currents; a capacitor is used to bypass the r.f. around the resistance. An example of the uses of bypass capacitors is given in Fig. 1.

Capacitors carry a "working voltage" rating that indicates the maximum d.c. voltage that should be allowed to appear across the capacitor. Always use capacitors that have at least as high a rating as that specified by the designer. (It is of course permissible to use units that have a greater voltage rating than specified.) If ratings are not given in the design (and this happens quite frequently) you needn't be at a loss to choose the proper rating; simply determine what the supply voltage is and then use capacitors with ratings equal to or greater than that voltage.

Capacitance values of bypass capacitors are not critical in the 80 through 100 metre range. Values from 0.01  $\mu\text{F}$  to 0.001  $\mu\text{F}$  are commonly used. If you use values much greater than 0.01  $\mu\text{F}$ , you run into two problems. First, the capacitor is likely to have significant inductance and the unit will not be an effective bypass at the frequency for

• The experienced Amateur knows that there is a wide tolerance in the values of many of the components that go into radio circuits, and very often a particular value is specified in a published description simply because it happened to be on hand at the time the circuit was tried out. The beginner, lacking this experience, sometimes misses opportunities to use what he already has, and thus is out of pocket for new parts he didn't really need to buy. This article should help answer the question "Can I substitute a such-and-such for a so-and-so?"

which it was intended. Second, the physical size of the capacitor will be much larger.

In v.h.f. construction, capacitors designed for this type of operation should be used. The older style mica and paper capacitors, while they may have the correct capacitance value, are not suited for v.h.f. work. The smallest (physically small) disk capacitors should be used. The biggest value of bypass capacitance is rarely more than 0.005  $\mu\text{F}$ , and even this value is used only for 6 and 2 metres. U.h.f. work requires special bypasses. The reason for limiting values to 0.005  $\mu\text{F}$  for v.h.f. work is that greater values will be inductive and physically large. It is important to keep lead lengths as short as possible in v.h.f. work, and this would be impossible if large capacitors were used.

Whenever t.v.i. suppression is a factor special bypassing techniques must be observed. This is a whole story in itself and cannot be covered in this article. However, the b.c.i. t.v.i. chapter of the Handbook treats the subject in considerable detail.

There is one other factor to consider when deciding on the value of a bypass capacitor. If the r.f. circuit being bypassed carries audio too, as in a modulated amplifier, the capacitance should be limited to a value that will not affect the higher audio frequencies—no more than 0.002  $\mu\text{F}$  in the ordinary case.

### COUPLING AND BLOCKING CAPACITORS

A "blocking" capacitor is used to couple r.f. (or audio) currents from one circuit to another and to isolate one of the circuits from a d.c. voltage present on the other. An example of the use of blocking capacitors is shown in Fig. 1 at C3, C4 and C8.

"Coupling" and "blocking" capacitors actually perform similar functions, and the two terms are usually interchangeable. The distinction is that the blocking capacitor is a special case of coupling capacitor, in that it has to "block off" d.c. that might be harmful if present on one of the circuits. The blocking function is not always needed, since in some circuit arrangements a coupling capacitor is called for even though no d.c. voltages are involved. However, in most transmitting applications the coupling capacitor is used because d.c. blocking is essential, and it is therefore proper to call it a blocking capacitor.

Capacitance values and voltage ratings are similar to those used for bypasses. In r.f. circuits a minimum value of about 100 pF is customarily used in the 80 through 10 metre range. Any value from 100 pF to 0.01  $\mu\text{F}$  is permissible in this type of circuit. Occasionally you may encounter circuits where critical values are specified, and in such cases the designer's specifications should be followed.

### POWER SUPPLY FILTER CAPACITORS

One of the purposes of a power supply filter is to smooth out the recti-

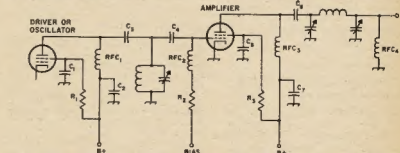


Fig. 1.—This typical circuit shows the uses of some of the components in a simple transmitter.

C1, C2, C3, C5, C7—Bypass capacitors.  
C3, C4, C8—Blocking or coupling capacitors.  
R1, R3—Voltage-dropping resistors.  
R2—Bias resistor.  
RFC1, RFC2—Plate r.f. chokes.  
RFC3—Grid r.f. choke.

RFC4—A.f. choke used as safety precaution in the event that C5 breaks down. In such case a dangerous d.c. voltage could appear on the feed line and antenna. With RFC4 in the circuit this voltage is short circuited if C5 is shorted.

fied a.c. voltage and keep the ripple percentage below certain limits. The power supply ripple should not exceed 5% for c.w. transmitters and should be no more than 1% for phone rigs. Modulator supplies and those for high-gain speech amplifiers should be held to considerably lower ripple figures.

The capacitance required in a filter capacitor, for a given ripple percentage, depends on the inductance of the associated filter choke. Let's consider the single section filter shown in Fig. 2A. The percentage of ripple obtained with this type filter is determined by the formula  $100 \div LC$ , where  $L$  is in henrys and  $C$  is in microfarads. It is obvious from the formula that in order to obtain 5% ripple the product of  $L$  and  $C$  must be at least 20. There is, of course, considerably more to the subject of power supply filters than can be given here. The Handbook should be consulted for information on other types of circuits.

The point to keep in mind is that there are certain minimum requirements for component values, and as long as the minimum requirements are satisfied a wide range of values can be used. For example, suppose the designer shows an 8  $\mu F$  capacitor but you happen to have a 16  $\mu F$  or 20  $\mu F$  unit in your junk box. Since your capacitor more than meets the designer's requirements, it can be substituted.

When substituting a different capacitor in a power supply, never use one that has a lower voltage rating than specified. You will be safe in assuming that the designer's rating is the minimum.

The use of electrolytic capacitors has, until recently, been largely confined to low voltage supplies (up to 600 volts), but there has been a trend in the last few years toward the use of electrolytics in high voltage supplies as well. By connecting two or more capacitors in series, as in Fig. 2B, the total voltage rating can be increased. For example, two 500 volt 16  $\mu F$  electrolytics can be connected in series to obtain a 1,000 volt rating, at the expense of halving the capacitance so that the total becomes 8  $\mu F$ . Nevertheless, this is often economical; for example, using the two electrolytics to obtain 8  $\mu F$  at 1,000 volts costs approximately \$1.75 while a similar capacitance in an oil-filled unit would be about \$9. It is permissible to substitute electrolytic capacitors for oil-filled or paper capacitors called for in a design, or in existing equipment. If, for example, a 10  $\mu F$ , 1,000 volt unit blows out in a power supply, it could be replaced by two 20  $\mu F$ , 500 volt electrolytics connected in series.

## VARIABLE CAPACITORS

A common question asked by beginners is whether they can substitute variable capacitors having different values than those specified in a particular piece of equipment. The answer is yes in many cases. Suppose the circuit calls for a variable capacitor with a minimum capacitance of 15 pF and a maximum of 100 pF, and you have a unit that has a range of 10 pF to 150 pF. The range required in the circuit would fall within the limits of your unit so it would be OK to use it. The only time you couldn't substitute would be when your unit doesn't have

a low enough minimum capacitance or a large enough maximum. However, designers usually allow a certain amount of "extra" capacitance as a safety factor, and if you know the inductance of the circuit being tuned by the capacitor, you can find out how much range is actually required. One method is to use the A.R.R.L. Lightning Calculator. The calculator will show you what capacitance is needed to tune a given range and will also show you how to find the inductance of r.f. coils.

In substituting for a variable capacitor in a transmitter it is just as necessary to keep voltage ratings in mind as in the case of fixed capacitors. Use a variable with at least as much air gap between plates as was used in the original equipment.

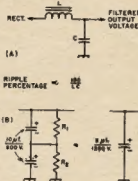


Fig. 2—A typical choke-input power supply filter is shown at A. The method of connecting capacitors in series to obtain a higher voltage rating is shown at B. When capacitors are connected in series each capacitor should be shunted with a resistor ( $R_1$ ,  $R_2$ ) with a resistance of about 100 ohms per volt of supply voltage. The resistors can serve as part or all of the bleeder resistor.

## RESISTORS

Resistors are used to provide bias voltages, to reduce or "drop" voltages, as bleeders in power supplies, and in many other applications. Most circuit designs are based on a plus-or-minus 10% resistance tolerance because resistors having this value of tolerance are generally available. However, in some cases tolerances are actually specified on a diagram, and in such event substitutions should be within the tolerance of the specified item. (This is, of course, true with any component.) If no tolerance is specified you can substitute any resistor value that falls within the 10% region.

Resistors can be connected in series or parallel to provide a desired resistance. For example, suppose the circuit calls for a 5,000 ohm, 2 watt resistor and you have two 10,000 ohm 1 watt units on hand. The two resistors can be connected in parallel to provide the 5,000 ohms at 2 watts. If you have a well-stocked junk box you'll probably find many combinations that will work in any particular circuit.

Circuit diagrams customarily specify the power ratings of the resistors required in a unit. It is, of course, OK to use resistors with a larger power rating than specified. Watch out for one thing, though: never substitute a resistor that has a power rating less than that called for.

Fixed resistors are supplied in two general types, wire-wound and composition. Never use the ordinary wire-wound type where it would have to carry r.f. Wire-wound resistors have an appreciable amount of inductance, which will upset the operation of an r.f. circuit.

If too much heat is used in soldering or unsoldering composition resistors, particularly the  $\frac{1}{2}$  watt size, the resistance value can change. It is a good idea to check previously-used resistors with an ohmmeter before installing them in a piece of gear.

## R.F. CHOKES

Another component that has wide use in radio equipment is the radio frequency choke. The inductance of an r.f. choke is intentionally made large, with respect to the inductance of a coil used in a tuned circuit, so that it offers a very high impedance at radio frequencies.

Examples of the use of r.f. chokes are shown in Fig. 1. RFC1 and RFC3 are connected in the d.c. leads to the plates of the tubes. These chokes prevent r.f. current from flowing back into the power supply. If a bypass capacitor alone was used for this purpose, the plate tank circuit would be bypassed and the amplifier wouldn't work. By installing the r.f. choke, the r.f. currents are prevented from flowing back into the supply but are not prevented from flowing to the tank circuit.

In transmitters in the 80 to 10 metre region choke values from 750 microhenrys to 2.5 millihenrys are commonly used. Tolerances are not "tight" and it is a possible to substitute values and have the equipment perform as it is intended to do. In v.h.f. construction, on the other hand, it is a good idea to follow the designer's specifications as closely as possible.

In some cases an r.f. choke will work well on most bands but may have a self-resonance in one particular band. When this happens the choke acts as a power-absorbing tuned circuit and will develop "hot spots." If the power level is high enough the choke may actually burn out. A grid-dip meter can be used to check a choke for such resonances. Connect the two ends of the choke together with a short length of wire and couple the grid-dip meter to the choke. Tune the grid-dip meter through the bands you plan to use, and if there are any hot spots they'll show up as a dip in the meter reading.

## POWER TRANSFORMERS

Two factors must be considered when deciding on a transformer substitution—the voltage and current ratings. Let's take current first. You can always substitute a transformer that has a current rating equal to or greater than that called for in the equipment. Transformer manufacturers usually design their transformers for continuous duty, not for Amateur service, which can be considered to be intermittent. This means that in many cases transformers used in Amateur equipment are underloaded rather than overloaded. Many designers of Amateur equipment know this and will take more power from a transformer than its rating ostensibly would allow.



## TECHNICAL TOPICS

### VALVES

**PREWAR** The Australian Amateur used mainly receiving valves in the final stage of his transmitter. Such types as the 45, 46, 47, 59 and E406 were in popular use.

In those days transmitting valves were expensive and in any case as the Amateur was then restricted to a power of 25 watts, the receiving valves gave him all the power he could use. These receiving valves cost approximately from 12/- to £1 each and allowing for a basic wage rise of roughly 1 to 3 from then to now, the equivalent cost in today's money would be from £2 to £3 each.

Type 6P6, which was a receiving type 42 with the plate lead brought out to a top cap and a separate pin for the suppressor grid, was made in Australia for small transmitters and met most of the needs of prewar Amateurs.

After the war, large quantities of surplus valves became available and with the lifting of the allowable power, first to 50, later 100 watts, and now to 150 watts, the type 807 available at less than 10/- became almost universally used by Amateurs.

In the last year or so it seems that further stocks of surplus valves have become available at very low prices and the Amateur can now purchase both receiving and transmitting types at the equivalent of a small fraction of their prewar value.

For an Amateur building a receiver, here are some of the cheap valves available—

For r.f. and i.f. stages:  
EF39, 6U7, 6K7, 12BK7, at from 3/- to 5/-.

Converter stage:  
ECH35 10/6, 6K3 6/8, 7A8 3/6.

Detector:  
6H6 1/6, 6CA 5/-.

Output:  
7C5 5/-.

For the transmitter oscillator:  
EF50, RL7, 1/6; 6AC7, 6SH7, 2/6.

Buffer-doubler:  
7C5 5/-.

Final:  
1625 4/-, 809 5/6, 803 17/8.

Modulator speech amplifier:  
7C7 1/11, 6C4 5/-.

Power amplifier:  
1625 4/-, 809 5/6, VT127 £1 per dozen.

to use manufacturers' and distributors' catalogues as a reference guide. For example, you may have a wafer switch on hand and aren't sure that it will be suitable for use in an r.f. circuit. The manufacturer's catalogue will usually provide this information. The same holds true for voltage and current ratings of components. Additional information on the subject is contained in an excellent article by Geiser<sup>1</sup> on capacitors. Also, the Handbook section on components and color codes is a good reference.

<sup>1</sup> Geiser, "Choosing Capacitors," "QST," July, 1960.  
<sup>2</sup> "Choosing Condensers," "A.R.," July, 1960.

### Rectifier:

NU12 4v. electrically equivalent to 5Z3, 1/8.

Valves that might be of special interest to the Amateur are:

7C7—a local base valve somewhat equivalent to 6SJ7.

7C5—electrically equivalent to 6V6, but with the short leads of the local base should be ideal for 58 Mc. r.f.

RL7—a hot bottle for the v.h.f. low noise r.f. stage—uses EF50 sockets.

1625—a 12 volt 807 but has 7-pin base.

809—ideal for zero bias class B triode modulator. With 500 volts plate and 2.4 watts drive, a pair gives 60 watts output. With 750 volts plate and 5 watts drive, the output becomes 100 watts.

VT127—a beam tube with 4 volt heater and Mazda octal base which physically resembles the 807. Should be ideal for AB1 or AB2 modulator but no data is available. At £1 per dozen one could afford to find what voltage the tube can handle by trial and error.

—J.A.G.

### EDITORIAL

(Continued from Page 1)

In the v.h.f. and u.h.f. part of the spectrum there is likelihood of fixed assignments for Amateurs whereas previously they were either shared or granted by local administrative powers. This is purely assumption at present and may finally be changed, but that's the way the wind is blowing.

And so in 1960 we see the same pattern appearing as history has shown previously—once the bands become useful to the commercial users, the Amateurs are gradually squeezed out because they have the lowest priority of any frequency user. You—the Amateur—have one real answer to this predicament! Populate the bands you have, for in this coming jet and rocket age it will be only those who have a use for the bands who will have grounds for fighting to retain them.

However hard the pill is to swallow, this is undoubtedly the position Amateur Radio finds itself in today after its years of worthwhile contributions to the advancement of the science. If anyone has an idea that we have an unassailable right to the bands we have allocated to us for ever and anon, let him study closely the trends of other people's thinking and he will finally come back to the same point—use the bands or others will use them for you.

Take heed in 1960 for in 1970 the going will be even tougher. Put your transmitter on the air regularly; encourage others to do the same; encourage young people to take up Amateur Radio as a hobby; and encourage your friends to join the W.I.A. It's an old adage, but Unity is still strength.

The Federal Executive and Federal Council of the Wireless Institute of Australia joins in wishing every Australian Amateur and Member a Prosperous New Year. Keep the signals radiating!

FEDERAL EXECUTIVE.

If you plan to substitute a transformer that has different ratings and are in doubt, there are a couple of ways of working out the problem. If the design tells you the total current requirements you can get a pretty good idea whether your substitution will work. However, this information isn't always furnished, and in such cases you'll have to estimate the total current by adding up the amounts taken by all the tubes.

While it is possible to take more than the rated current, intermittently, from the plate winding of a transformer without seriously overloading it, this is not generally true of the filament or heater windings because the tube filaments usually run continuously. As long as the filament winding rating in your substitute is equal to or greater than the actual heater current demanded by the tubes it is all right to use it. Incidentally, beginners frequently ask if it is OK to use a filament winding that has a greater current rating than is required for the tube or tubes they plan to use. For example, a tube may be rated at 6.3 volts, 1 amp, and the transformer can deliver 5 amperes at 6.3 volts. This doesn't mean that 5 amperes have to flow through the tube heater; the current will be only 1 ampere because that's all the tube will take when the proper voltage—6.3 volts—is applied to the heater. All that happens is that the transformer winding runs a lot cooler than it would if it were loaded to full capacity.

Where voltage ratings are concerned it is generally possible to substitute transformers that are not exactly the same as originally specified. For example, a transmitter circuit may call for a 400-0-400 volt transformer and you have one giving 350-0-350 on hand. The 350 volt transformer can be used, but the power input will be lower than it would have been with the higher voltage job. In most cases the difference will not be serious. It may be necessary to increase screen voltages to bring them back up to rating; this is usually a simple matter of reducing the screen-dropping resistance appropriately.

If the output voltage of the substitute transformer is too high, you can use voltage-dropping resistors or a voltage divider to bring the voltage down to what is required. But watch out for the possibility of overheating filter-capacitor voltage ratings when you do this. The power supply section of the Handbook should be consulted for information of voltage dividers.

### POWER SUPPLY CHOKES

As shown earlier, the inductance required in a power supply choke depends on the amount of capacitance used in the filter circuit. Here again, as with other components, there is plenty of flexibility. You are usually safe in substituting chokes that have a larger inductance than the one specified, without making any other changes in the filter circuit, as long as the choke has a similar current rating. As with transformers, the manufacturer's ratings on chokes are for continuous duty, so there is considerable tolerance available for Amateur service.

If you have any doubts about substituting certain components in particular applications it is a good idea



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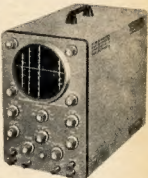
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Rise Time: 0.008 microseconds or less.  
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8WR	8"	7	30-15k c.p.s.	£7/0/0	2/3	3/8
12WR	12"	10	30-15k c.p.s.	£7/9/7	2/11	4/4

These Speakers are available with Voice Coil Impedance of either 2.7 or 15 ohms. 2.7 ohm Transformers are available to suit all types from 500 ohms to 14,000 ohms. C.T. 30/9 each. Pack and Post: Vic. 1/10; Int. 3/-.  
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# A SUBSTITUTE FOR TRANSISTORISED AUDIO IN 12 VOLT RECEIVERS

V. KERR,\* VK4LK

**W**ITHOUT question the transistor is supreme for the audio portion of the so called "hybrid receiver," however when costs are taken to account, that is driver and output transformers plus the cost of transistors, almost half of the total cost of a receiver goes for the audio portion.

Once the mobile-portable fraternity really recognises the convenience, plus efficiency, offered by the 12 volt type of valve, it goes without saying these will have a universal application for r.f. purposes in any receiver designed for mobile or portable use. If and when transistors do get on a comparable price level with the "humble valve," the mixture of both will no doubt be very desirable.

Recently the acquisition of a new jalopy with a 12 volt electrical system called for a review of the previous 6 volt "buzz box" which provided the necessary entertainment while motor-ing. It could have been converted for

\*P.O. Box 180, Charters Towers, Qld.

12 volt vibrator operation without a great deal of effort. After taking into account the cost of a 12 volt vibrator transformer and vibrator, the decision was made to come into line with present trend for automobile receivers and make a "hybrid job" of it.

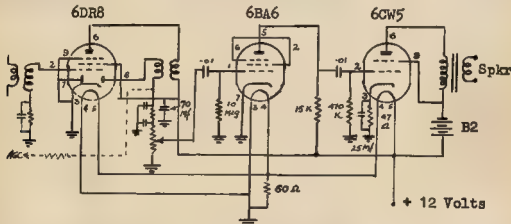
My "favourite wholesaler" was unable to supply the needs for a transistorised audio end without some delay. In the interim the r.f. portion of the receiver had been completed using the 12 volt types. Having an urge to see just how it performed after the change over, the output from the diode of the 6DR8 was fed into a conventional amplifier and tune up proceeded with.

Having got thus far, the thought struck me, if these high gm types do so well as r.f. amplifiers, why not see how they will fare as audio types on low voltage. Searching about, the 6CW5 appeared to be a suitable subject for trial. It was quite a surprise the amount of audio which it produced with

only 12 volts for plate and screen, however the addition of a 9 volt transistor battery, in series with the 12 volt supply (B2 on circuit diagram) really started the thing making real noise and without much apparent distortion. I might add it would be hardly fair to feed the output from the 6CW5 to a 3 or 4 inch speaker and expect good results. In my own case it is fed into a 9-7 speaker with a 2,500 ohm transformer between the 6CW5 and the voice coil of the speaker. All the values of resistors, etc., have been arrived at by cut and try methods, and the values shown have proved to give the best performance in this set-up. The 6BA8 is hooked up as a triode, otherwise things remain conventional.

The 60 ohm shunt resistor across the filaments of the 6DR8 and 6BA8, while not the correct value to match in with the 0.71 amp. filament of the 6CW5, appears to work quite satisfactorily in the series-parallel filament hook-up, this being the nearest to the correct value on hand it was naturally used.

To anyone who would like to try a receiver using the 12 volt types, I can recommend the inclusion of the audio portion as detailed, thus saving quite an amount when compared with the cost of a fully transistorised audio portion.



## THE AR7 AND S.S.B.

(Continued from Page 3)

with the audio volume control. In many instances best results are obtained with the r.f. control right off.

No bandspreading has been applied to the 3.5 Mc. band as, so far, it has not been found necessary.

Due to the large bandwidth on 7.0 Mc., there is an apparent lack of selectivity. This is typical with all systems using such a large amount of bandspread and a 455 Kc. i.f. system. The crystal filter of the AR7 will help a lot and the receiver's i.f. channel should be lined up with the crystal, which is nominally on 455 Kc. Changing crystals can cause a lot of poor reception when the filter is in use and each set should be adjusted with its own crystal in circuit. Replacing the second and third i.f. transformers with the latest Aegis high selectivity transformers will

also help. The crystal filter input transformer should not be replaced unless a satisfactory replacement is available.

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A Command Q5'er, connected to the grid circuit of the 2nd i.f. stage by twisting a couple of turns of wire around the grid lead will work wonders as far as selectivity is concerned. However, it will probably be found that under the condition of extreme selectivity that is then obtained the tracking of the AR7 is not perfect. A similar check on a lot of other receivers will reveal the same thing.

Finally, remember that a receiver is only as good as its operator and these modifications will make the operator's life a lot easier and allow him to get more enjoyment from his receiver, the old faithful AR7.

## REFERENCES

- "Modifying the AR7," "Amateur Radio," May, June, July, August, September, 1957; December, 1958; January, 1959.
- "Amateur Radio," April, 1956.
- "Radiotron Designers' Handbook," pages 662 and 663.

# QSL'ING

B. J. SMYTH,\* WIA-L2001

THE world over, at a conservative estimate, there are five times as many s.w.l.s. as transmitters. The majority of these s.w.l.s. are interested in getting QSL cards from the transmitting station. The result is that there is a heavy flow of s.w.l. reports. Considerable thought should be given to a number of things when s.w.l.s. consider their method of sending QSL cards. It is a well known fact that to obtain a verification from a b.c. station your report must include part of their programme details at the time you heard them.

Many Amateurs do not QSL, are not interested in receiving QSLs even from fellow Amateurs, and consequently do not have a QSL card, so what hope has a s.w.l. got? But that is a calculated risk you must take.

Methods of reporting an Amateur signal must not be haphazard, and you are faced with a number of problems. Design your card so that it will fit on a size of  $5\frac{1}{2}'' \times 3\frac{1}{4}''$ , which will fit in a normal envelope. If you make them large they cannot be sent at post-card rate because they will exceed the size allowed by the P.M.G. regulations.

Have all the details which an Amateur wished to know printed wherever possible. This does two things. He saves considerable time filling them

out and permits you to post them at commercial paper rate. Do not send a report to a DX station who is in QSO with your next door neighbour. He already knows he is getting to your location, but preferably report on a QSO between two stations in entirely different countries to your own. Do not report to a station that you heard calling CQ. Unless he has never worked an Australian station before, he will not be interested and he is almost certain to have no log entry anyway.

EXAMPLE OF QSL CARD AUSTRALIA	
To Radio -	Shortwave Listeners' Group, N.S.W. Div.
W.I.A.	
SWL Report on your Me. contact at GMT with	Your... Signals were RST
My Rx	My Ant.
Remarks	
Please QSL Direct or Via Bureau. 73	
B. J. Smyth, 33 Mintaro Avenue, South Strathfield, N.S.W.	

Size of card:  $5\frac{1}{2}'' \times 3\frac{1}{4}''$  inches.  
Suggest W.I.A. Badge and Listener Number be overprinted in Red, printing in Prussian Blue on a buff coloured card.

If you wish to send your QSL cards via the W.I.A. Bureau you unfortunately cannot add personal remarks to your QSL as they become a breach of P.M.G. regulations for commercial papers so if you add remarks you must send them through the post yourself.

Keep the call sign of the station you are reporting clear of other remarks as this helps the passage of your card through the Bureaux. Nothing slows up sorting QSL cards more than trying to

find the call of the station to whom it is going. Make the call sign clear and definite and save mis-routing. One important factor in reporting is to use G.M.T. always. Can you readily write down what E.S.T. in U.S.A. or Central European time is at any particular local time? But it's easy in G.M.T. to convert to local time.

In conclusion, make the reports you do send as careful and comprehensive as possible. Look for stations not able to raise DX. Get your reports out on the bands difficult for DX, like 80 and 40 metres.

One final word of warning! Please refrain from adding personal remarks on QSL cards if forwarding by the Bureaux and avoid the disappointment of having your cards returned by the P.M.G. officials.

## ACKNOWLEDGMENT

I wish to thank Frank Hine VK3QL the N.S.W. Division QSL Bureau Manager, for his help in assisting me compile these notes.

## HINTS AND KINKS

### DRILLING HINT

When modification of a unit includes drilling holes in its steel chassis, the following trick can often save trouble that might follow after the modification is made. Insert a small magnet under the area to be drilled and, if possible, inside the chassis. The magnet will catch the steel shavings which might otherwise collect in spots and endanger the original circuitry.

—J. Wimmer, WERPK, 'QST,' Mar '59.

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# W.I.A. OFFICIAL LIST OF COUNTRIES FOR DXCC PURPOSES

The list of countries hereunder (as at 1/1/60) and as amended from time to time in Federal Awards Notes is the Official List to be used in connection with the issue of the Australian DXCC Award.

The list below shows first the Prefix, the Country, and the Zone Numbers in parenthesis (as used for "CQ" WAZ award).

AC3-Sikkim .. (22)	FY7 Fr Guiana & Inini (39)	OD5-Lebanon (20)	VP6-Barbados (9)
AC4-Tibet (23)	G-England (14)	OE-Austria (15)	VP7-Bahama Is. (6)
AC5 Bhutan (22)	GC Channel Is. (14)	OH-Finland (15)	VP8-(See CE9)
AP2-Pakistan (21, 22)	GD-Isle of Man (14)	OH0-Aaland Is. (15)	VP8-Falkland Is. (13)
AV (C3)-Formosa (24)	GI-Northern Ireland (14)	OK-Czechoslovakia (15)	VP8, LU-Z-South Georgia (13)
C-China (23, 24)	GM-Scotland (14)	OK4-Belgium (14)	VP8, LU-Z-South Orkney Is. (13)
C3-(See BV)	GW-Wales (14)	OQ5, 6-Belgian Congo (38)	VP8, LU-Z-South Sandwich Is. (13)
C8-Manchuria (24)	HA-Hungary (15)	OX, KG1-Greenland (40)	VP8, LU-Z, CE9AN-AZ-Sth. Shetland Is. (13)
CE-Chile (12)	HB-Switzerland (14)	OY-Faroes (14)	VP9 Bermuda (5)
VP8, ZLS, etc.-Antarctica (13, 29, 30)	HC-Ecuador (10)	OZ-Denmark (14)	VQ1-Zanzibar Is. (37)
CE8-(See VP8)	HE-Galapagos Is. (10)	PA0, P11-Netherlands (14)	VQ2-Nth. Rhodesia (36)
CE0-Easter Is. (12)	HE-Liechtenstein (14)	PJ-Neth. West Indies (9)	VQ3-Tanganyika Terr. (37)
CE0-Juan Fernandez Archipelago (12)	HH-Haiti (8)	PJ2M-Sint Maarten (9)	VQ4-Kenya (37)
CM, CO-Cuba (8)	HI-Dominican Repub. (3)	PX-Andorra (14)	VQ5-Uganda (37)
CN2-Tangier (33)	HK-Columbia (9)	PY-Brazil (11)	VQ6-Br. Somaliland (37)
CN8-Morocco (33)	HK0-Archipelago of San Andres & Providencia (9)	PY0-Fernando de Noronha (11)	VQ8-Chagos Is. (39)
CP-Bolivia (33)	HL-Korea (25)	PZ1-Neth. Guiana (11)	VQ8-Mauritius (39)
CR4-Cape Verde Is. (10)	HP-Panama (7)	SL-DM-Sweden (14)	VQ8-Rodriguez Is. (39)
CR5-Port. Guinea (36)	HR-Honduras (7)	SP-Poland (15)	VQ9-Seychelles Is. (39)
CR5-Principe, Sao Thome (36)	HS-Thailand (26)	ST2-Sudan (34)	VR1-Br. Phoenix Is. (31)
CR8-Angola (36)	HV-Vatican City (15)	SU-Egypt (34)	VR1-Gilbert & Ellis Is., Ocean Is. (31)
CR7-Mozambique (37)	HZ-Saudi Arabia (31)	SV-Crete (20)	VR2-Fiji Is. (32)
CR8-Goa (36)	II, IT1-Italy (15)	SV-Dodecanese (20)	VR3-Fanning & Christmas Is. (31)
CR9-Macao (24)	IT-Trieste (15)	TA-Turkey (20)	VR4-Br. Solomon Is. (28)
CR10-Port. Timor (28)	IS-Italian Somaliland (37)	TF-Iceland (40)	VR5-Tonga Is. (32)
CT1-Portugal (14)	IS1-Sardinia (15)	TG-Guatemala (7)	VR8-Pitcairn Is. (32)
CT2-Azores (14)	JA, KA-Japan (25)	TI-Costa Rica (7)	VS1-Singapore (28)
CT3-Madeira Is. (33)	JT1-Mongolia (25)	TIR-Cocos Is. (7)	VS4-Sarawak (28)
CX-Uruguay (13)	JY-Jordan (25)	UA1, 2, 3, 4, 6-European S.F.S.R. (15, 16, 17)	VS5-Brunel (28)
DJ, DL, DM-Germany (14, 15)	KZ0-Neth. New Guinea (28)	UA1-Franz Josef Land (40)	VS6-Hong Kong (34)
EA-Philippine Is. (27)	KJ, W-United States of America (3, 4, 5)	UA9, 0-Asiatic Russian S.F.S.R. (17, 18, 19, 25)	VS9-Aden & Socotra (21)
EA-Spain (14)	KA-(See JA)	UA0-Wrangell Is. (19)	VS9-Maldives Is. (22)
EA6-Baleares Is. (14)	KA0, KG61-Bonin and Volcano Is. (97)	UB5-Ukraine (16)	VS9-Sultanate of Oman (21)
EA8-Canary Is. (33)	KB6-Baker, Howland and American Phoenix Is. (31)	UC2-Azerbaizhan (16)	VU2-India (22)
EA9-Irni (33)	KC4-(See CE9)	UD6-White Russian (16)	VU4-Laccadive Is. (22)
EA9-Rio de Oro (33)	KC4-Navassa Is. (8)	UE6-Azerbaijan (21)	VU5-Andaman & Nicobar Is. (28)
EA9-Span. Morocco (33)	KC8-East. Caroline Is. (27)	UG6-Armenia (21)	W-(See K)
EA0-Spanish Guinea (36)	KC6-West. Caroline Is. (27)	UR8-Turkoman (17)	XE, XF-Mexico (8)
EL-Eire (14)	KG1-(See OX)	UI8-Uzbek (17)	XE4-Revilla Gligedo (8)
EL-Liberia (35)	KG4-Guantanamo Bay (8)	UJ8-Tadzhik (17)	XV-Viet Nam (28)
ET2-Eritrea (37)	KG6-Mariana Is. (27)	UL7-Kazakh (17)	XW8-Laos (26)
ET3-Ethiopia (37)	KG61-(See KA0)	UM6-Kirghiz (16)	XZ2-Burma (28)
F-France (14)	KH6-Hawaii (31)	UN1-Karelo-Finnish (16)	YA-Afghanistan (21)
FA-Algeria (33)	KJ1-Johnston Is. (1)	UO5-Moldavia (16)	YI-Iraq (31)
FB8-Amsterdam and St. Paul Is. (39)	KL7-Alaska (1)	UP2-Lithuania (15)	YJ-(See FU)
FB8-Comoro Is. (39)	KM6-Midway Is. (31)	UQ2-Latvia (15)	YK-Syria (20)
FB8-Kerguelen Is. (39)	KP4-Puerto Rico (8)	UR2-Estonia (15)	YN-Nicaragua (7)
FB8-Madagascar (39)	KP6-Palmira Group, Jarvis Is. (31)	VE, VO-Canada (2, 3, 4, 5)	YO-Roumania (7)
FB8-Tromelin Is. (39)	KR8-Ryuku Is. (25)	VK-Australia (29, 30)	YU-Salvador (7)
FC-Corsica (15)	KS4-Swan Is. (7)	VK2-Lord Howe Is. (28)	YU-Yugoslavia (15)
FD-Togo (35)	KS4-Roncador Cay and Serrans Bank (7)	VK9-Nauru (28)	YV-Venezuela (9)
FE8 Fr. Cameroons (36)	KS4-American Samoa (32)	VK9-Norfolk Is. (32)	VY0-Aves Is. (9)
FE8 Fr. West Africa -Repub. of Guinea (36)	KV4-Virgin Is. (8)	VK9-Papua (28)	ZA-Albania (15)
FG7-Guadeloupe (8)	KW8-Wake Is. (31)	VK9-Ter. of New Guin (28)	ZB1-Malta (15)
FK8-New Caledonia (32)	KX6-Marshall Is. (31)	VK0-(See CE9)	ZB2-Gibraltar (14)
FL8 Fr. Somaliland (37)	KZ5-Canal Zone (7)	VK0-Heard Is. (30)	ZC3-Christmas Is. (29)
FM7-Martinique (8)	LA-Jan Mayen (40)	VK0-Macquarie Is. (30)	ZC4-Cyprus (20)
FO8-Clipperton Is. (7)	LA-Norway (14)	VO-(See VE)	ZC5-Br Nth. Borneo (28)
FO8 Fr. Oceania (32)	LU-Svalbard (14)	VP1-Br. Honduras (7)	ZC6-Palestine (20)
FP8-St. Pierre and Miquelon Is. (5)	LU-Argentina (13)	VP2-Anguilla (8)	ZD1-Sierra Leone (35)
FP8 Fr. Equat. Africa (36)	LU-Z-(See CE9, VP8)	VP2-Antigua, Barbuda (8)	ZD2-Nigeria (35, 36)
FR7-Reunion Is. (39)	LX-Liechtenstein (14)	VP2-Br. Virgin Is. (3)	ZD3-Gambia (35)
FS7-St. Martin Is. (8)	LZ-Bulgaria (20)	VP2-Dominica (8)	ZD6-Nyasaland (37)
FW8, YJ-New Hebrides Is. (32)	M1-San Marino (15)	VP2-Grenada & Dep. (8)	ZD7-St. Helena (36)
FW8-Wallis & Futuna Is. (32)	M1-Bahrain Is. (21)	VP2-Montserrat (8)	ZD8-Ascension Is. (36)
	MP4-Qatar (21)	VP2-St. Kitts, Nevis (8)	ZD9-Tristan da Cunha (32)
	MP4-Trucial Oman (21)	VP2-St. Lucia (8)	ZE-Sth. Rhodesia (36)
	OA-Peru (10)	VP2-St. Vincent and Dependencies (8)	ZK1-Cook Is. (32)
		VP3-British Guiana (9)	ZK2-Niue (32)
		VP4-Trinidad & Tobago (8)	ZL-Chatham Is. (32)
		VP5-Jamaica (8)	ZL-Kermadec Is. (32)
		VP5-Turks & Caicos Is. (8)	

(Continued on Page 15)



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## PREDICTION CHART, JAN. '60

Mc. E. AUSTRALIA — W. EUROPE S.R. Mc.  
0 2 4 6 8 10 12 14 16 18 20 22 24  
GMT

45  
30  
15  
7

E. AUSTRALIA — W. EUROPE I.R.  
0 2 4 6 8 10 12 14 16 18 20 22 24

45  
30  
15  
7

E. AUSTRALIA — MEDITERRANEAN  
0 2 4 6 8 10 12 14 16 18 20 22 24

45  
30  
15  
7

E. AUSTRALIA — N.W. U.S.A.  
0 2 4 6 8 10 12 14 16 18 20 22 24

45  
30  
15  
7

E. AUSTRALIA — N.E. U.S.A. S.R.  
0 2 4 6 8 10 12 14 16 18 20 22 24

45  
30  
15  
7

E. AUSTRALIA — N.E. U.S.A. I.R.  
0 2 4 6 8 10 12 14 16 18 20 22 24

45  
30  
15  
7

E. AUSTRALIA — CENTRAL AMERICA  
0 2 4 6 8 10 12 14 16 18 20 22 24

45  
30  
15  
7

E. AUSTRALIA — S. AFRICA  
0 2 4 6 8 10 12 14 16 18 20 22 24

45  
30  
15  
7

E. AUSTRALIA — FAR EAST  
0 2 4 6 8 10 12 14 16 18 20 22 24

45  
30  
15  
7

W. AUSTRALIA — W. EUROPE  
0 2 4 6 8 10 12 14 16 18 20 22 24

45  
30  
15  
7

W. AUSTRALIA — N.W. U.S.A.  
0 2 4 6 8 10 12 14 16 18 20 22 24

45  
30  
15  
7

W. AUSTRALIA — N.E. U.S.A.  
0 2 4 6 8 10 12 14 16 18 20 22 24

45  
30  
15  
7

W. AUSTRALIA — S. AFRICA  
0 2 4 6 8 10 12 14 16 18 20 22 24

45  
30  
15  
7

W. AUSTRALIA — FAR EAST  
0 2 4 6 8 10 12 14 16 18 20 22 24

45  
30  
15  
7

# The Receiver Method of Phasing Alignment

STAN BOURKE,\* VK2EL

**C**ONTRARY to popular belief, it is possible to do a very good job of aligning a phasing s.s.b. transmitter using nothing more than the station receiver, a simple audio oscillator, and a fair supply of patience.

Before we proceed, let's review the sideband theory very briefly (Figs. 1 to 4).

Fig. 1 represents an unmodulated c.w. signal or carrier on your pet frequency. If we now modulate this carrier with, say, a 1,000 cycle tone we will get the familiar picture of Fig. 2, with the two a.m. sidebands spaced a kilocycle up and down from the original frequency. Since s.s.b. is just an ordinary a.m. signal with the carrier and one sideband taken out, we get the pictures in Figs. 3 and 4, depending upon which side is being used. Nearly all phasing alignment methods make use of this idea that a single audio tone will produce just one signal when the transmitter is properly adjusted.

Plenty of information has been published on how to do this with an oscilloscope, but it can be a rather bewildering experience, the first time you look for one of those "minimum ripple patterns." Despite the helpful information it's really not too easy to decide whether carrier, other sideband, audio harmonics or something else is causing this or that ripple. Most 'scopes can't synchronise on an r.f. signal either, so you have to ride hard on the fine frequency control at the same time you are making other adjustments and the whole business could get bad enough to worry an adept octopus!



Many sideband converters are old c.w. hounds and for you this receiver method should be old hat. A.m. chaps may have to concentrate a little harder, but the whole operation is much harder to describe than to carry out.

To try yourself out turn on the station receiver and look at WWV whilst they are playing the 800 cycle tone. Put the b.f.o. on and set it near the middle of your i.f. passband. Now tune very slowly through the signal, ignoring the ticks. If you can pick out the three separate signals or beats you will have no trouble at all. If you have selectivity to spare by all means use it both now and later when we get down to business, but you can manage with a standard i.f. strip if you have to. You don't have to have super selectivity if you can mentally sort out beat notes whilst others of different frequencies are present, as we do often in c.w. QRM.

\* 17 Chisdel Avenue, Canterbury, N.E.W.

Here is a block diagram (Fig. 5) of the most usual type of phasing transmitter. I have included this to help to identify the controls I will mention, but I'm sure you will have no trouble in applying the principle if your own transmitter differs from this.

Let us assume that your new transmitter is finished and ready for alignment. You will need a simple audio oscillator having a reasonably good waveform, such as the one in Leder's (ZLIAAX) article in this magazine (July 1959) or "CQ" July 1958 (VK-2AC). Please be careful not to overdrive anything with the tone.

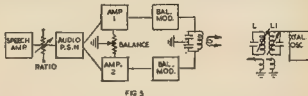


FIG 5

From here on I will try to summarise the steps:

- (1) Carefully balance carrier out. The controls will interact a little and the dip will be fairly sharp, but it should go away down in the mud.
- (2) Apply 1,000 cycle tone (keep level low).
- (3) Set audio balance control to about centre of its range.
- (4) Tune slug in L1 about one turn out from point where crystal starts to oscillate. You have now finished with this one.
- (5) Tune the slug of L2 about one turn in beyond the resonant frequency of the crystal.

Tune the receiver slowly across the frequency with the b.f.o. on—you should hear the two sideband signals and they will be fairly easy to separate as they will be two kilocycles apart. If all is well, one will be quite a bit louder than the other one. Pick on the big fellow and tune your receiver so that you have him at, say, a 200 cycle note and good and loud. At this point remember that the carrier will be about a one kilocycle note and the other sideband will be about two kilocycles away. Both will be a lot weaker than the one you have got your ear on (Fig. 4).

Now switch the sideband switch in the transmitter without touching anything else. Your 200 cycle growl should drop in level. Reach for two screwdrivers and apply them to the ratio and L2 controls. Get one driver in each hand and you will very quickly find a very sharp and almost complete null. Ignore what the higher pitched signals are doing meanwhile—you're not listening to them, are you? Re-balance the carrier (it will come unstuck a little each time you tune L2) and then go hunting for a good loud signal with your receiver. You will find it about

two kilocycles away and you should tune for your 200 cycle beat note again. Put the sideband switch in the transmitter back to the first position. Again the 200 cycle signal will drop, but unless you are very lucky, it won't go right out. Take careful note of just where ratio and L2 controls are set now and go into the two-screwdriver act again. You will find new spots close by where you will be able to lose the signal you are now concentrating upon. Try to split the difference between these and the first settings and try adjusting the audio balance control. Your object is to get a perfect null each

way round with all adjustments coinciding. Be prepared to switch and re-tune several times to get it just right.

Avoid the temptation of trying to favour the sideband you will be mostly using. You can get perfect suppression of a single tone on one sideband and have none elsewhere. The careful compromise seems to give best all round results.

## BOUND VOLUMES OF "A.R."

In response to inquiries, the Publications Committee of the Wireless Institute of Australia has made available a number of bound volumes of "Amateur Radio" containing the twelve issues for 1959. These volumes cost 25/- (including postage) and can be obtained by forwarding the above amount to the W.I.A., Victorian Division, P.O. Box 38, East Melbourne, C.2, Victoria.

If you require your own copies bound into one volume, send, or deliver, your file of magazines, together with a slip plainly marked with your name and full address (block letters) to the office of the "Richmond Chronicle," Shakespeare Street, Richmond, E.1, Victoria. The cost of this service is 7/6, including return postage to anywhere in Australia, and this amount should be remitted when forwarding your magazines.

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# NATIONAL FIELD DAY, 1960

## RECEIVING SECTION

The rules shall be the same as for the transmitting stations and is open to all Short Wave Listeners in the Commonwealth and Mandated Territories.

Logs shall take the same form as for transmitting sections, but will omit the serial number received. Logs must show the Call Sign of the Station Heard, the Serial Number Sent by it, and the Call Sign of the Station being worked.

Scoring will be on the same basis as for transmitting stations. It will not be sufficient to log stations calling CQ. A station may be logged once only for phone and once for c.w. in each band.

Awards.—Certificates will be awarded for the highest scores in each Call Area.

**T**HE proposed rules for the N.F.D. Contest for 1960 have been agreed to by all States, but, in accordance with comments and suggestions received by the Federal Contest Committee, a few alterations have been made to increase the attractiveness of the Contest. The revised and final rules are printed below.

It will be seen that a section has been added for fixed stations and that a separate section has been provided for multiple operator stations. Also the duration of the Contest has been reduced to eliminate the all-night session on Saturday night and to allow more time for packing up and returning home on Sunday.

As the rules stand now, it is possible for every Amateur to enter either individually or as a member of a group, and if he chooses to stay home and work the portable stations there is a section for him to contest.

There should be plenty of stations for the portable stations to work as they can work anyone and count every contact—provided, of course, that they obtain a serial number from the other party. It is now up to all those who have portable or mobile equipment to set it up in the field and show just what can be done by Amateurs away from their own home location. So what about making an effort this year and popularise this Contest as never before?

**DATE: Saturday and Sunday, 13th and 14th February, 1960.**

**DURATION: Saturday 1800 to 2300 hrs., Sunday 1900 to 1600 hours.**

**OBJECTS:** The Operators of Portable and Mobile Stations within the Commonwealth and Mandated Territories will endeavour to contact other Portable/Mobile and Fixed Stations.

## RULES

1. There shall be five sections to the Contest:—

- Portable/Mobile Transmitting, Phone.
- Portable/Mobile Transmitting, C.W.
- Portable/Mobile Transmitting, Multiple Operators, Open only.
- Fixed Transmitting Stations working Portable/Mobile Stations; Open only.
- Reception of Portable/Mobile Stations.

2. All Australian Amateurs may take part. Mobile or Portable Stations shall be limited to an input of 25 watts to the final stage. This power shall not be derived from any public or private mains.

A Portable/Mobile Station shall not be located within a radius of one mile from the home(s) of the operator(s), nor be situated in any occupied dwelling or building.

Portable/Mobile Stations may be moved from place to place during the Contest.

No apparatus shall be set up on the site selected earlier than 24 hours prior to the Contest.

All Amateur bands may be used, but no cross-band operation is permitted.

3. Amateurs may enter for either (a) or (b), or both, in the Portable/Mobile Sections.

4. One contact per station for phone and one for c.w. per band shall be permitted.

5. Entrants must operate within the terms of their licenses and in particular observe the Regulations with regard to portable operation.

6. Serial numbers consisting of the RS or RST report plus three figures commencing with any number between 001 and 100 and increasing by one for each successive contact shall be exchanged.

7. Scoring:—

(a) **Portable/Mobile Stations:**

For contacts with Portable/Mobile Stations outside entrant's call area

15 points.

For contacts with Portable/Mobile Stations within entrant's call area

10 points.

For contacts with Fixed Stations outside the entrant's call area

5 points.

For contacts with Fixed Stations within the entrant's call area

2 points.

(b) **Fixed Stations:**

For contacts with Portable/Mobile Stations outside entrant's call area

15 points.

For contacts with Portable/Mobile Stations within entrant's call area

10 points.

8. The following shall constitute call areas: VK1 (A.C.T.) and VK2, VK3, VK4, VK5, VK6, VK7, VK9, and VK0.

9. **Logs**—All logs shall be set out under the following headings: Date/Time, Band, Emission, Call Sign, RST/No. Sent, RST/No. Received, Points Claimed.

In addition, there shall be a front sheet showing the following information:—

Name ..... Address .....  
Call Sign ..... Section .....  
Call Signs of other Operators (if any) .....  
Location of Portable/Mobile Station—  
.. From ..... hrs. to ..... hrs.  
.. From ..... hrs. to ..... hrs.

A brief description of equipment used, bands used, and points claimed, and the following declaration:

"I hereby certify that I have operated in accordance with the Rules and the spirit of the Contest."

Signed ..... Date .....

10. The right is reserved to disqualify any entrant who, during the Contest, has not observed the Regulations or who has consistently departed from the accepted code of operating ethics.

11. The decision of the Federal Contest Committee of the W.I.A. is final, and no disputes will be entered into.

12. Certificates will be awarded to the highest scorer in each section in each call area.

## RETURN OF LOGS

All entries must be post-marked not later than Saturday, 28th February, 1960, and addressed to the Federal Contest Committee, W.I.A., Box 371B, G.P.O., Hobart, Tasmania.

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# SOME CHARACTERISTICS OF VALVES AT LOW VOLTAGES

D. MOLLER\*

With the intentions of one day going mobile, I found the article by H. F. Ruckert, VK2AOU, in September "A.R." very interesting. As a result I decided to check the characteristics of several valve types at low voltages. The equipment (an Avo Mutual Conductance Valve Tester) had a minimum voltage of 20 volts for anode and screen. However, the results obtained at this voltage may give some indication of their characteristics at 12 volts.

I first tested the valves under normal operating conditions with the following results (published valve data conditions and mutual conductance for comparison). Note in the following tables, T. means Tested; P., Published.

Anode Volts	Screen Volts	Grid Volts	Anode mA.	Mutual Conduct.
<b>6AK5—</b>				
T. 150	150	-2.5	9.0	6000
P. 150	140	-3	7.0	4300
T. 150	100	-2	5.0	5100
P. 120	120	-2	7.5	5000

<b>5654/6AK5W—</b>				
T. 150	150	-2.5	12.0	6250
T. 150	100	-2	5.3	5100

<b>6AH6—</b>				
T. 300	150	-2	13.0	10000
P. 300	150	-2	10.0	9000

<b>6AU6—</b>				
T. 250	150	-1	9.6	6000
P. 250	150	-1	10.8	6200
T. 250	150	-2	4.9	4200
P. 250	150	-2	6.0	3950
T. 100	100	-1	4.2	4600
P. 100	100	-1	5.2	3900

<b>6BA6—</b>				
T. 250	100	-1	11.2	4700
P. 250	100	-1	11.0	4400
T. 100	100	-1	10.9	4550
P. 100	100	-1	10.8	4300

<b>EF93—</b>				
T. 250	100	-1	9.2	4000
T. 100	100	-1	9.0	3900

<b>6AM6—</b>				
T. 250	250	-2	13.0	8500
P. 250	250	-2	10.0	8200
T. 200	150	-1.5	5.3	7000
P. 200	150	-1.5	4.0	6400

<b>8D3/6AM6—</b>				
T. 250	250	-2	12.3	8500
T. 200	150	-1.5	4.5	6600

Although all valves were new, where two valves of the same type (6BA6, EF93) (6AM6, 8D3) (6AK5, 5654) were tested, variation in results occurred, the valves showing similar differences on the low voltage tests, results of which are as follows (the three columns are grid voltage, anode current and mutual conductance respectively)

\*Member Townsville Amateur Radio Club; Base Sqn., R.A.A.F. Base, Townsville, Qld.

<b>6AK5—</b>				
Plate 40v., Screen 20v.	Rg	Ip	Gm	
	1.0	0.3	2550	
	-0.8	0.7	2950	
	-0.6	1.5	3600	
	-0.5	1.8	3650	
	-0.4	2.0	3550	

<b>5654—</b>				
Plate 40v., Screen 20v.	Rg	Ip	Gm	
	-1.0		1250	
	-0.8		1550	
	-0.6		2250	
	-0.4	0.5	2600	
	-0.3	1.0	3050	
	-0.1	1.2	3400	

<b>6AH6—</b>				
Plate 40v., Screen 20v.	Rg	Ip	Gm	
	-0.6		2500	
	-0.4	0.25	3000	
	-0.3	0.6	3650	
	-0.2	0.9	3750	
	-0.1	1.2	3650	

<b>6AU6—</b>				
Plate 40v., Screen 20v.	Rg	Ip	Gm	
	-0.8		1450	
	-0.6		2200	
	-0.4	0.2	2600	
	-0.3	0.5	2700	
	-0.2	0.8	2650	

<b>6BA6—</b>				
Plate 40v., Screen 20v.	Rg	Ip	Gm	
	-1.0	0.5	1600	
	-0.8	0.8	1850	
	-0.6	1.0	2250	
	-0.4	1.4	2250	
	-0.2	1.9	2150	

<b>EF93—</b>				
Plate 40v., Screen 20v.	Rg	Ip	Gm	
	-0.8		1100	
	-0.6		1450	
	-0.4	0.5	1600	
	-0.2	0.9	1800	
	-0.1	1.6	1950	

<b>6AM6—</b>				
Plate 40v., Screen 20v.	Rg	Ip	Gm	
	-1.0		1250	
	-0.8		2150	
	-0.7	0.3	2800	
	-0.6	0.6	3100	
	-0.4	1.0	3250	
	-0.3	1.5	2850	
	-0.2	1.7	2750	

<b>8D3/6AM6—</b>				
Plate 40v., Screen 20v.	Rg	Ip	Gm	
	-1.0		1450	
	-0.8		1700	
	-0.7		2150	
	-0.6		2600	
	-0.4	0.5	2950	
	-0.3	1.0	3000	
	-0.2	1.1	2900	

Note.—With grid bias of -0.2v., neither of the latter two tubes would operate

From these results there would seem to be no way to estimate the results of valve operation at low B<sub>+</sub> voltages, other than by actual experiment with the valves in the circuits in which they are intended to operate.

## ITU. REPRESENTATIVE ILL

It is with great concern that the announcement is made that John Moyle, VK2JU, officially accredited W.I.A. representative with the Australian Delegation to the Extraordinary Administrative Radio Conference in Geneva, is gravely ill.

He had symptoms of a serious illness in the last few weeks in Geneva and on medical advice postponed his proposed onward journey through the U.S.A. and the U.K. on behalf of his Company returning to Australia immediately where he was immediately admitted to hospital.

At the time of going to press with this issue of the magazine the news is not good. An operation was performed, the result of which did not come up to expectations. If John is able to leave hospital it is doubtful whether he will be able to resume work again.

John put his heart and soul into the job for his three months with the Delegation and did not spare himself in his efforts to have the Amateur bands retained for Australian Amateurs. For this we shall be forever grateful and at this time we extend to his family and the Directors of his Company our sincere wishes for his rapid recovery.

## TECHNICAL ARTICLE AWARD

The Publications Committee has pleasure in announcing that the Technical Article Award for 1959 has been made to Mr R. E. W. May, VK1PM, for his article "Plate Modulated D.S.B.C. or D.S.B.S.C."

As Technical Articles are in short supply, the Committee would appreciate receipt of an article on your latest experiments.

## MISSED NOTES

Apparently some correspondents failed to note the earlier closing date of this issue. Copy should be in our hands by the 8th of each month, except December when the date is advanced to the 1st of that month so that the January issue can be printed prior to the Xmas holidays.

## W.I.A. Official List of Countries for DXCC Purposes

(Continued from Page 11)

ZL—New Zealand	(32)
ZL5—(See CE9)	
ZM6—Br. Samoa	(32)
ZM7—Tokelau Is.	(31)
ZP—Paraguay	(11)
ZS1, 2, 4, 5, 8—Union of S. Africa	(38)
ZS2—Prince Edward & Marion Is.	(38)
ZS3—South West Africa	(38)
ZS7—Swaziland	(38)
ZS8—Basutoland	(38)
ZS9—Bechuanaland	(38)
3A—Monaco	(14)
3V8—Tunisia	(33)
3W8—(See XV)	
4S7—Ceylon	(22)
4W1—Yemen	(21)
4X4—Israel	(20)
5A—Libya	(34)
9G1—Chana	(35)
9K2—Kuwait	(21)
9M2—Malaya	(28)
9N1—Nepal	(22)
9S4—Sasr	(14)
—Aldabra Is.	(39)

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The assistance of Ken TKA is of great help to the "green" secretary at the meeting. A few more full members of the W.I.A. would be a valuable asset to the Group, both for their advice and assistance to new members who wish to obtain the full ticket.

It was suggested that all headmasters of senior schools be approached with the view of obtaining new members from the interested pupils from their respective schools.

The second Wednesday of the month was decided as the most favourable to hold our meeting, so Pat and Ted have their fingers crossed and sincerely hope that there is a big roll-up of intending members.

Thanks must go to the Institute for the offer of the use of their receiver and library, so if the meetings don't encourage members, the last two items might act as bait.

Buses are closed at 9.30 a.m. and all present paid a visit to Ken TKA's home and had a sample of "monkey chatter" (sorry Ken, I must agree s.a.b. has a good point). Ken contacted a couple of lads in the mainland and all present had the pleasure of having a pow-wow over the air. A tour of inspection was then given to the various pieces of kit (anything missing, Ken?), following which we all retired to our various homes after a very informative first night.

Next Wednesday for the month. How about rolling along next meeting and providing a bit of interesting news for next time?

For those interested, however, the address is E. A. (Ted) Beard, WIA-L7055, 148 Derwent Avenue, Lindfield, Hobart, Tas.

Now to my young friend, Don Granley, he forwards the following:

#### RE COORDINATION

WYENA will QSL 100 per cent. JTEKAA on 80 meters. The R40 prize has been won by higher frequencies are Australia. ZERB will QSL only to Commonwealth listeners, and only if an I.R.C. is enclosed. VQNS and VPBC are also the ones to watch.

Judging by the few notes which are sent to ZER for the DX page, it would seem that this is not a popular bedtime amongst the listeners. It is very different from the where the I.S.W.L. magazine has had to limit the number of stations printed. Don't neglect to send your notes to the group in the way by which we can show that we are not the useless body that a few individuals would make us out to be. For the VK3 A.F.s, any who are interested in the group list of stations heard to Maurice, he will pass them on to me as we are in contact by mail regularly. I will then, in turn, pass them on myself have them. We will direct them to our Listeners from other States are invited to send their notes to ZER, he will be very pleased to hear from you.

JAICA—My old friend Hags sent a long record this week, giving me details of conditions of Amateurs in his country. He answers all reports, and is an ardent stamp collector. Address is 547 Mure Mitaka Tokyo.

Nothing to report from overseas this month, but I would like to draw your attention again to the Pacific and American stations on 80 mc c.w. at from 1900K onwards. Most of them are working into 2L and are readable 4/7 or 5/7. I have not been able to get any reports for many weeks now, but am back on the job again, active all bands to 3 mc. complete with ve beam.

#### NATIONAL FIELD DAY

S.w.i.s from all States are advised to read the rules (elsewhere in this issue) and enter this Contest. To any chaps who have not participated, we cordially invite you to enter the contest. The winner of the contest is the top score of 214 points, credited to a VK3 listener.

#### SENDING QSL REPORTS

Most of the active listeners in Australia have, at some time, forwarded reports to Amateurs. A few of us have been very fortunate, in that the passing of one cycle of years, and many others have not done so. I am beginning to see the other side of the picture. When I first started to send my cards, I was very much surprised, regardless of whom and where. Many others do the same thing. But replies are not forthcoming. Why?

In the past I have been one of the strongest critics of the non QSLing Amateur, but with the passing of one cycle of years, and many hundreds of reports, I am beginning to see the other side of the picture. When I first started to send my cards, I was very much surprised, regardless of whom and where. Many others do the same thing. But replies are not forthcoming. Why?

You send a report to a VK3 who is working a chap in your State. All right, he knows that he is getting there and doesn't want a further report. The same. You send an other card to old Harry who lives five miles

away. He doesn't appreciate it at all, for if he is operating on 40 or 80, he jolly ought to be getting out.

Then there is the fellow who says, "I heard you at 8 p.m. send me a card. Don't laugh, fellas, it has happened! There are a few of the examples which can cause ill feeling between Amateurs and s.w.i.s. If we all try and avoid these traps, our contacts will be of and of value, then we are not to blame if our cards are ignored.

#### BUSH FIRE NEWS

Look out for the Western District (Vic) net VLST74 on 3363. Westerners on 8885, and Morlae on 3340 KC. Many of the members down there are licensed Amateurs, but being a fire net, don't expect a card.

VLST74 reports could be sent to Don 3AKN whom I think will be pleased to hear from you. These are nets by the way from are not always the Amateur affairs they are made out to be. Whilst admitting that our net can be a bit haphazard at times, the same cannot be said for many others. It is a treat to listen to the operating procedures on some of these frequencies, and a good instruction for those who are new to the hobby.

I will arrange a card from VLERS on 3122 KC, for any good reports, and I am sure Henry Wicks will be still giving it. Hope the VLST74 a little further up the band. This latter is on every Monday at 8 a.m. sharp.

#### QSL LADDER

	Countries	Heard	Confirmed	Points
Eric Trebilcock	247	247		
Ian Thomas	74	13	9	
Don Granley	108	46	28	
Maurice Cox	181	181		
Wes HULL	182	182		
Tom Hayward	83	8		

Thanks once again, Don, your letters are always full of interest. Keep up the good work, and I hope you will be able to give us the VK3 notes as supplied by Tim Mills.

#### NEW SOUTH WALES

A new year with us again and I have only just stopped writing this letter. Looking back on 1959 it has been a good one for us. Our membership increased by well over 1000 members. I hope that the Santa could get down your chimney, with all the long wires and beams on it and left you something that was useful in the radio line. I hope that something in the line will be useful to you.

I would like on behalf of the VK3 Group to wish every other s.w.i. the best for this year and the Group extends a challenge to all comers in all contests for the year.

From Don L3333. Anyone hearing JZJHA and needing a QSL card, should send a report to WICKEN, 150 Kethay Ave, Durrig, N.Y., U.S.A., who is JZJHA's QSL manager. (I suggest that they include a self addressed envelope and an I.R.C.) Thanks Don. I would like to extend to all visitors to Sydney during Australia Day week-end, an invitation to attend the Divisional Convention, which will be held at the W.I.A. Club. The Group is one of the sections that is putting a display on, so how about coming out for the day? Anyone coming to Sydney for their holiday, please drop in to see the group. I am addressed via Box 1134, G.P.O. Sydney.

At our November meeting the Group discussed at length short QSL cards. At the time of writing the results have not been passed on to our Divisional Council. Until this is done, the full list is not complete, but at this time I am going to discuss the results into two sections. The first was an award open to any listener anywhere, requiring 100 VK cards in a ratio from each State. The second section dealt with awards for use within the W.I.A. Listener Groups. Most of the ideas were on the types that are in use overseas but none of them were liked. I am going to suggest only a short time as such before obtaining their tickets. I am sure that the material of their ability is available. It is hoped that these awards will assist this aim.

It has been found that in the running of the Group, a lot of work has been required. This is now being drawn up and a copy will be passed onto the secretaries of Interstate Groups. If any of you live in a State where the name of the Group is not known, please order, "write direct to us, S.W.I. Secretary, C/O Box 1724, G.P.O., Sydney, for your copy. Please supply the stamp, with the name on the back. On the subject of reports of any kind, please return them either to this Division or to Maurice for "A.R."

So till next month, the best of listening to me.

71, de Your Scribe.

**Maurice Cox, WIA-L3055**  
Flat 1, 37 Boyd Crescent,  
Olympic Village, Heidelberg,  
N.33, Victoria.

Rt fellow Short Wave Listeners. This is my scribble once more with the news and doings of all s.w. listeners. I hope the bands have been kind to you all and that you may all be successful in your listening and projects for this New Year. Whatever you are and whatever you do, I wish you all the best for the New Year.

Now down to the news and doings. I have very good news. We, the s.w.i.s., have been given a full page in "A.R." so at this stage I would like all you s.w.i.s. to drop me a line to your activities, your score for the countries heard and confirmed ladder. I would like you to send your Amateur countries heard for the DX page to Don Granley, Holbrook N.W., and any information to s.w. h.c. to me so be in it chaps, give me the information to keep the page going. I don't even mind if an Amateur writes to me (hi). Now I would like to thank the Publications Committee for allowing us to have the full page. I only hope that I can justify their generosity in allowing us to have it. Also my thanks to the Editor for the help he has given me, thanks Ron.

For the benefit of the States which have not got a Group going, the following are the rules of the Victorian S.W.I. Group which, I hope, if formed, you will observe so that all States are in line with each other.

1. Membership is open to anyone interested in the Amateur radio hobby, and is particularly for listeners no matter what bands they listen on, i.e. short wave broadcast, broadcast, or Amateur bands.

2. Membership shall be essentially same as Associate membership to W.I.A. except that those under 18 years shall not be charged for membership. All fees are as for Associate membership.

3. From the general members each year, there shall be elected a President, Vice-President, Secretary, Assist Secretary and any committees considered necessary (i.e. contest, organising, etc.).

4. President shall be responsible for conducting all meetings, etc., and to act as chairman of the group. Vice-President shall act in his capacity when the President is absent. Secretary to act as group correspondent, etc., magazine correspondence to forward to me, and to prepare notes for W.I. broadcast each Sunday.

5. (And the last) The Group's aim is to cater for all persons interested in radio. Provide a meeting place to discuss radio and events, etc., Arrange demonstrations and exhibitions of equipment relating to the hobby. Organise excursions for members' participation, and competitions as it sees fit. To encourage its members into the field of Amateur Radio with its associated literature.

Well that's R, you s.w.i.s., organise your State Groups on these lines and you can't go wrong.

#### CORRESPONDENCE

Which there is not enough of. Come on now chaps, you know what I want. Help me fill this page up.

Here is a letter from Mac Willard L3074 and he quotes: "At the present time I am rearranging the ryling set-up here. I hope to be erecting a 3500V c.w. band 7000 Mc. in the near future and I guess I'll be kept busy for a time." Well, how about that chaps, he's a s.w.i. and he's into it like I am. I wish it were I. Mac also said he now has 48 countries confirmed. Congrats, Mac. He has also found conditions DZ month (Nov.). poor. Thanks for your letter, and keep the page going. By the way, chaps, send me your scores re countries heard, confirmed and zones confirmed. So far there is only five of us in it.

#### S.W.I. GROUP IN TASMANIA

The W.I.A. S.W.I. Group (Tasmanian Division) held its inaugural meeting on 11th November and was most successful. It was a disappointing, it was agreed to elect a President and Secretary Mr Pat Geaves was elected President and Mr E. A. (Ted) Beard Secretary.

## A SELECT LIST OF BOOKS FOR HAM ENTHUSIASTS

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★ BEAM ANTENNA HANDBOOK, by William I. Orr, W6SAI	32/6 " 1/6 "
★ A.R.R.L. ANTENNA HANDBOOK	31/- " 2/- "
★ "CQ" ANTHOLOGY—THE BEST OF "CQ" 1945-52	20/9 " 1/6 "
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★ NEW SIDEBAND HANDBOOK, by Don Stoner	31/- " 1/9 "
★ SINGLE SIDEBAND FOR THE RADIO AMATEUR—A.R.R.L.	24/- " 2/- "
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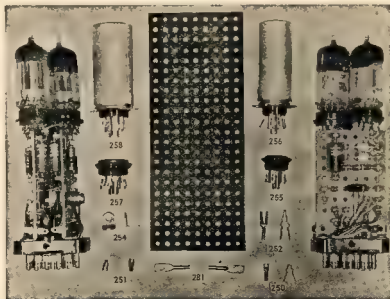
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# CORRESPONDENCE

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

## W.I.C.E.N.

Editor "A.R." Dear Sir,

It would seem to me that the wrong approach is being taken in the organisation of W.I.C.E.N.

Except for a few Amateurs who are going along, all enthusiasm has vanished, but I am sure that all would be on deck if they were needed in an emergency.

It should be understood that the Amateur is an individual at heart, and as such has no liking for red tape, but also that even the most unco-operative of us only live for the day the rig can be used to save life and property. So in any emergency Amateur Radio will be used as it ever was, and with the same good result. It need not be otherwise.

It is a tragedy to see how some feeling of service procedure, but it is impossible to envisage a situation where an Amateur would be called on to use it in its precise form. The solution would be to have a system which co-operate with would know nothing of this procedure anyway. (The Police, Flying Doctor, P.H.O. and the many other services about the country).

Some criticism must be levelled at the organisers of W.I.C.E.N. even though I know that they are quite sincere and are trying their best to do a job. However, it is my opinion that a different approach should be considered. I am sure most Amateurs are of the same opinion.

As an example, I quote what took place in New South Wales during the North Coast, and the W.I.C.E.N. session following:

VKAAWS related his activities during the danger period, in which he told of how he had difficulty in obtaining an up-to-the-minute weather forecast. He made the mistake of saying "weather report" instead of "weather forecast," but there should have been no doubt as to what he meant. Anyway briefly, he asked another amateur to get him a weather forecast made available to Amateurs during flood danger periods. The answer he got was a long dissertation which went on and on for nearly an hour, instead of the weather report. Well on the next over, Lou politely explained about the gross purposes, and requested the answer to be given in the form of a C.D.O. wanted messages sent, it was up to him, the C.D.O., to see that they were directed through the proper channels, etc., etc., and that he would like to send what was told to and nothing else, or words to that effect.

Now anyone will agree that this was a bad mistake. In the first place an Amateur, placed in Lou's way, was to get outside information more so than to send it out. After all, they were the ones who required the forecast, so that the C.D.O. would know how to act.

Actually, another Amateur further north was heard setting the same information from Sydney through Amateurs who had got the information by phone from the weather office. I suppose they were passing third party traffic, but I know that you know for the C.D.O. in Lou's area to get the information and by then the damage was done.

In the same session, reference was made to the radio nets owned by the C.D.O. We were told that these nets would not be any use for long distance communication, but only for local use, on account of their low power—about 10 watts. I know, as I have been in the nets for State wide service and moreover they were bad. There are quite a number of nets, working on 3.5 Mc, 7 Mc, 14 Mc, 21 Mc, 28 Mc, 3.5 Mc, 7 Mc, 14 Mc, 21 Mc, 28 Mc, 3.5 Mc, 7 Mc, 14 Mc, 21 Mc, 28 Mc. To name a few. The Forth-Cumbein, Flying Doctor, W.C. & I.C. D.M. and others. I know, because I was engineer-in-charge of the W.C. & I.C. D.M. net for many years. Inception in 1947 till 1952. We were using 332 sets and worked a radio phone service day and night from Dubbo to the most remote parts of N.S.W. on 332 Mc and 332 Kc. This net is still in operation.

As to the approach that should be taken, I think it is a matter of having good mobile units, good weather forecasts, good nets, and send messages with minimum fuss and delay without confusing side talk. And last, but not least, that great ability the older Amateurs have of intervention in an emergency. Remember VKXKN at Kempsey in 1950?

Much could be written on this subject and I think a study of the A.R.R.L. may show the way.

In conclusion, I would like to stress the fact that this letter is not to be taken as an attack on anyone and that nothing could be further from my intention, but as an effort to perhaps give a little more of an idea of how this question should be approached, and to perhaps start some more interest.

—R. B. HENSLEY, VKXKP.

## SHORT WAVE LISTENERS AND AMATEURS

Editor "A.R." Dear Sir,

Over the last couple of years S.W.I. Groups have sprung up within the Divisions of the W.I.A. It is very good that the interest is being shown, but the fact that the Groups are "drifting apart" is perturbing. To expand this statement, why has one Group grown very rapidly? Another large one much slower? Another State without a Group and another having dropped theirs? Why does another State make a difference between s.w.'s and associates? I thought that they were one and the same. I realise one too well how hard it is to organise and run these Groups, but it is time to really get together and put every S.W.I. Group in every State on an equal footing with each other and their own Divisions.

To make this possible it is up to everybody to do his share. While a great number of Amateurs have done outstanding work on behalf of the s.w.'s, others have done a lot of harm. The statements on the air about s.w.'s in general, by not answering some of the many excellent QSLs that they receive, although they use the information and I.R.C.'s contained in them. There are some cases that have come to my notice where a Amateur does not send s.w.'s, by refusing to pass on general information to them, but these same "Hams" cannot do enough for the chap with the call. (Some of you are on my black list).

Not all the blame is with the Amateur though, for s.w.'s should take more care with their activities. Some QSL their "next door neighbour" or supply incorrect information. It is not the s.w.'s who are to add all weight to the listener opposition. If more is to be known of the work of the listener, then it is up to the s.w.'s to publicise his activities, how about entering the next contest or sending in a DX report? You cannot sell a product without advertising.

May I take this opportunity to personally thank those who have made a difference for their time and efforts spent to build up the W.I.A. Short Wave Listeners' Groups.

—TIM MILES, WIA-1303/VK2TJM, Secretary S.W.I. Group, N.S.W. Div.

P.S.—The views expressed above are my own and not necessarily those of the Group. I would like to hear from the Secretaries of Interstate Groups or any other interested.

## NEW QTH FOR EX-HK1XL

Editor "A.R." Dear Sir,

From the May issue of your magazine I have had the pleasure of reading the contents. At the moment I don't know the sender of the magazine. I am a paid up member of the W.I.A. From May to August (the last received), I have read the most wonderful article on s.w.b. Congratulations to the author and to you the editor of the v.k. fan club.

Please QSP to the VK boys that I am going to QSY from my present QTH to Bogota as HK1XL. I will be active again as HK1XL from 15th December on 30, 35 and 10 metre bands of phone only. I will be very glad to meet again all my numerous friends over there and also to all the VK boys that may need HK for DXCC.

My new address will be: Edmundo Quinones P.O. BOX 124, Bogota, Colombia.

After more than one hundred contacts with VK boys I was unable to hook someone in the Northern Territory for my VK Certificate. I hope to have better luck as HK1XL. Many thanks and best 73.

—EDMUNDO QUINONES P.O. EX-HK1XL, in December HK1XL.

## ROSS HULL MEMORIAL V.F.F. CONTEST RULES

Letters have been received from A. W. Rushby (VK2AAR) and R. R. Rushby (VK2KX) of the matter of late publication of the rules of the Ross Hull Memorial V.F.F. Contest. These have been forwarded on to the Federal Contest Committee.—Editor.

## DX

(Continued from Page 17)

## ADDRESSES

MPATAP—Via DJ2JK  
VSRH—Rg. Mackie, R.A.P., Khoramakur  
VBSW B.E.O. 170 Christmas Island, via Honolulu  
HS1D—P.O. Box 1036, Bangkok  
VQ8B—Via VQ8P  
ODSCL—Scott Magneta, F.A.A., U.S. Embassy, Beirut, Lebanon  
FLIX—Charles E. Reed, Box 18, Harbel Liberia  
FGTXZ—Geydy Serge, 31 Rue Jeanne d'Arc, Grand Mour, Guadeloupe, F.W.I.  
ZD7SE—Via W6ML, 212 Jakeman St., Bayside, N.Y.  
HZITA H.R.H. Prince Talal al Saud, The Royal Palace, Riyadh, Saudi Arabia  
HRSAB—Via HRIAB P.O. Box 76, Tegucigalpa, D.C., Honduras.

## VK COMMENTS

I worked VKACX the other day—2AMZ was on the key. Laurie says there does not seem to be much c.w. activity in VK, in VKland, most of the chaps seem to be phone cranks.

2AQJ found band conditions to be very erratic for the month, 30 metres very changeable, 40 rather noisy, c.w. seems at times; 15 OK to U.S.A. in the middle of the day and good to Europe after 1200z. Bud is very active on S.B.B.

Don't was not very active as he had been pretty busy otherwise, he did hear some nice ones but had too much competition.

Frank QSL says that UG5 still eludes his net somehow.

2AOM found conditions on 20 metres very peculiar, one night there would be plenty of activity, and the next almost dead. As far as his station was concerned, more DX was logged than for a long time.

44W was heard on a heavy QRN, being so far north and in the thunderstorm period of the year.

RED comments with regret, and surprise that no reports on 28 Mc. activities appeared in the November "A.R." He says "It seems that 28 Mc. activity in VK is pretty low. Why? I don't know. I am sure Ham seems to be having the band available on his tx. A little mail reading on 40 seems to supply the answer, My rx is no good on 10 or I never hear anything there." Was he supplied rather than convincing list to show that plenty can be worked on 10 metres.

44W had reports and comments from each of the following s.w.'s and wish to thank them for their valuable assistance: L2001, L3022, L3053, L3063, L3074 and BERS-103.

I am greatly indebted to "QPY," the weekly Amateur magazine from Don Chesser, VKXXV (via 3QJ) for much of the material in News and Notes.

Thanks for the Merry Christmas and Happy New Year Greetings received. I hope all readers of "A.R." had a good Christmas and that the New Year will be pleasant and prosperous.—VK2ER.

## VHF

(Continued from Page 18)

During the meeting, the field days for 1959-60 were discussed and the following laid down. The first will be held on 26th and 27th (Sat. Field Day), Feb. 21, Mar. 13 and April 11 and that National Field Day rules apply. Scoring will be based on the % and 1 m groups. 20m. Bonus points for operators on 238 Mc. and above, a multiplier of three will apply to points for contacts. There will be 10m. scale contests for each field day, also an aggregate result over the five days. Logs submitted on 14 days and 14 days for 32FQ or 32GD within 14 days. The field day for checking Results will be announced at the next v.h.f. meeting—32GF.

## SOUTH AUSTRALIA

Fox Hunts have been held regularly every month on Saturday nights with very good results. The last was on 26th, 27th and 28th, Jan. 22, saw a change to daylight hours, unfortunately though the attendance was good, the weather was oppressive. Two hunts were conducted with Harry and I being the first hunt on 20. Hughie SAV came second. On 28th Mr. Gilbert SGX came in first with Graham DX, second, and Max came in third. He has and has managed to successfully operate gear with one switch control. Col. SRO is looking for a sv. generator so that he can join the mobile group.—32AW.





considerably. The new fees are as follows: Full Members, 25/-; Junior Members, 10/- per year.

The Annual Picnic held at Yoorourring Reservoir, near Whittlesea, on Sunday, 13th December, was quite a success. Even the all nature were indulged in, and the kiddies enjoyed their ice cream, sweets and toys.

Our January meeting will be held in our room on Friday evening, the 22nd, when final arrangements are to be made reference team and gear for the National Field Day. A Prosperous New Year to you all.

## QUEENSLAND TOWNSVILLE

What a surprise in reading Nov. "A.R." that "Myxomatosis" had failed to exterminate my old friend 4 Peter Rabbit (4PR). The battle must have been tough but he survived, hence notes from the capital city at long last.

During my recent holidays, during which I travelled to Perth, where John 6GU and XYL toy and children, welcomed me on the platform. John changed status to art as my chauffeur and we certainly saw all that was to be seen, also met a few of the boys.

In the beautiful city of Adelaide, Gordon 8XU took me along to the Council meeting to meet the boys. Doc 8MD escorted me home after offering free accommodation which was reluctantly declined. Think of those tax payers! Doc? Ken 8IM showed the suburbs around Lockleys. Gordon 8XU disappointed when the satellite failed to appear as he introduced me to the Moon Watch Group. Hope you have been successful since I left.

In Melbourne George 8AOM did the honors in taking me out to see Headquarters and around as many executive members as could be visited. Also took me to the Dandenong Ranges. Thanks George. Opportunity was taken to get hits and places to visit.

On arrival in Sydney, Bill 2AIL, Jim 2AKU and Ernie 2ADL made certain I was not left stranded a homeless waif. It was just one hectic rush to the various suburbs to meet as

many of the boys as possible. Very sorry that my part was so heavy, I was unable to accept all the gear that was offered. In fact a few XYLs wanted to donate complete stations! A visit to Dural was arranged—certainly the locality for an Amateur point of view. The very nice, Bill 2AIL in his new car arranged the run in mileage, with me a passenger, around the various resorts. Quite a nice trip, sorry to leave.

In Brisbane, although time was very short, it was arranged to meet Stan 4SA, 4FN, 4ZM, 4FP and others. Also a visit to a specialist was arranged and his advice will be rigidly observed. Hal 4DO as usual was there to meet me at Rockhampton.

On arrival home, Bert 4LB was soon to call to see if I had expanded any after drinking all the tea that was brewed in my honor at the various schools.

Conditions on the bands have been very poor and today (Sunday) no W.I.A. news was heard from Brisbane. Tonight no VKs were heard on any band.

Now that the New Year has arrived, I want to wish you one and all the best in 1960. 73 Bob.

## SOUTH AUSTRALIA

The monthly general meeting of the VKS Division, better known as The Division, for November was held in the club rooms to a capacity audience, which was regarded with what is probably the best lecture they have had in many a year. The lecturer for the night was Mr. Brian Neale, of Philips Industries, Henden, and his subject was "Transistors and their Applications." I think the one thing that appealed more than any other, was the down-to-earth manner in which he tackled the lecture. As quality Control Engineer of the transistor laboratory at Henden, he could have been excused if he had at times gone above the head of his average listener, but at no time did it look like becoming too technical and the interest was maintained from the start to the finish. We thank Philips Industries for their generosity in making available the test

gear necessary to the lecture, and were most impressed with the Tektronix cathode ray tubes which he had a set of the latest American pieces of test equipment. The vote of thanks to the lecturer was proposed by Bob 4PU, who, in his speech, also expressed the warm thoughts of all present as to their appreciation of the splendid job that Mr. Neale had done.

General business did not bring to light anything of particular importance other than that Council had taken up the matter of the attitude of the Housing Trust toward the erection of aerials by its tenants and its effect on W.I.A. members. Council was pleased to announce that the Trust would permit the erection of aerials, and this would also apply to Associate Members and genuine S.W.s. It was also stated that should any person who was genuinely interested in radio experimentation, providing that he presented to the Trust a letter from a responsible person to that effect, the Trust would give the application the consideration that it deserved. Council is to be congratulated on its efforts and once again demonstrated that unity is strength, and that whilst individualism will quite often brush off the individual, it will always co-operate with an organized body. Non members please note.

There was no distribution of QSL cards due to the General Meeting. The meeting was held on the 10th of November, and the members had called him all the nasty names they could think of, the meeting finished at 10.30 p.m. on the 10th of November. I do not mention the 10th either because I was a dryant or Leith 8LG, not because he was at the meeting to lay off him, as his wife was there, and he was a dryant, not because he threatened to knock my block off if I didn't lay off, but simply because I remember that Confucius once said, that who was wise and runs away, lives to write another day."

I forgot to mention that "Mine Tinkie Austin" (SCA) was chairman of the meeting, and also that John 5SK was present, and made a presentation on W.I.C.E.N. in general terms, and also stressed the need for volunteers and a general interest in the benefit of the community, plus the valuable publicity for Amateur Radio through W.I.C.E.N.

The news from the Upper Murray gang is a little on the light side this month. In fact it was any lighter there wouldn't be any at all. Apparently Tom's (8TL) recent course in business management, or something, has taught him to be economical with words, and I am reaping the result. The only news that I have is that Tom and Hughie 5BC went into a huddle over a Commscope 22 of Tom's and came out of it with an unserviceable tube. The new tube enabled a signal from Doc 8MD to be heard one Sunday night, but whether this information was a compliment or a complaint, I have yet to find out.

Received a little note from Bill 5HR this month with the information that he was browsing through a 1933 copy of "QST" and noticed that "A" stations had worked all continents on phone, among them being Don Taylor (8DX). Don can still be heard with a f.b. phone signal on the same frequency as my band that he has haunted for so long, although I must admit that I have heard him on 14 Mc. c.w. from time to time. He is the bloke from the Black Forest, remember?

Rex 5KY has not been heard on the air so much lately. He has not been altogether 100 per cent, has been battling it out with a race of bolts and therefore can't excite. Nasty things Rex, hope all OK now. I had one once, never talk about it much, memory too painful, ate my meals off the mantle-piece for three days.

Rex 8DO has finished re-building his house and is now busy winding transformers for his new famous tri that will end all tri's. How often do we hear that said, only to be contradicted six months later. Anyway, that is as it should be and is probably what keeps our grand old hobby going. You have not made any statements to the local paper lately Rex!

Neil 5ZAW has been co-opted to the Council and has been assigned to handle all the public work associated with the disposals section. Nice work, OM.

Received a card from a V87 this month who has apparently returned to G land and either had a touch of the conscience or has recovered from a lapse of memory, because it was dated 1933, I repeat, 1933. It had been through the VK6VU Bureau and also through Bob 8Druce, who incidentally has been out of Amateur Radio for so long that I hate to think back. It could be a joke of course, but who would want to play a joke on Don? I answer that. I mentioned to Doc 8MD that the postal authorities always got their man and he remarked that they would have a hard job in my case. By the look on his face I

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